STATUS OF LEVEL 2 PRODUCT

PRESENTATION TO AIRS SCIENCE TEAM

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Status Of Results For The IEEE Paper

Simulation done at GSFC based on November 2001 version of December 15, 2000

    Need run at GSFC to get statistics on clear column radiances, OLR

    All radiances in a golfball are at central zenith angle

Granule 401 shown

Only cases where both microwave product and first product were successful at JPL were used

    Microwave product - did not have updates to algorithm

    First product - "score" threshold was < 1.5

Some upgrades made in final product retrievals compared to what is at JPL
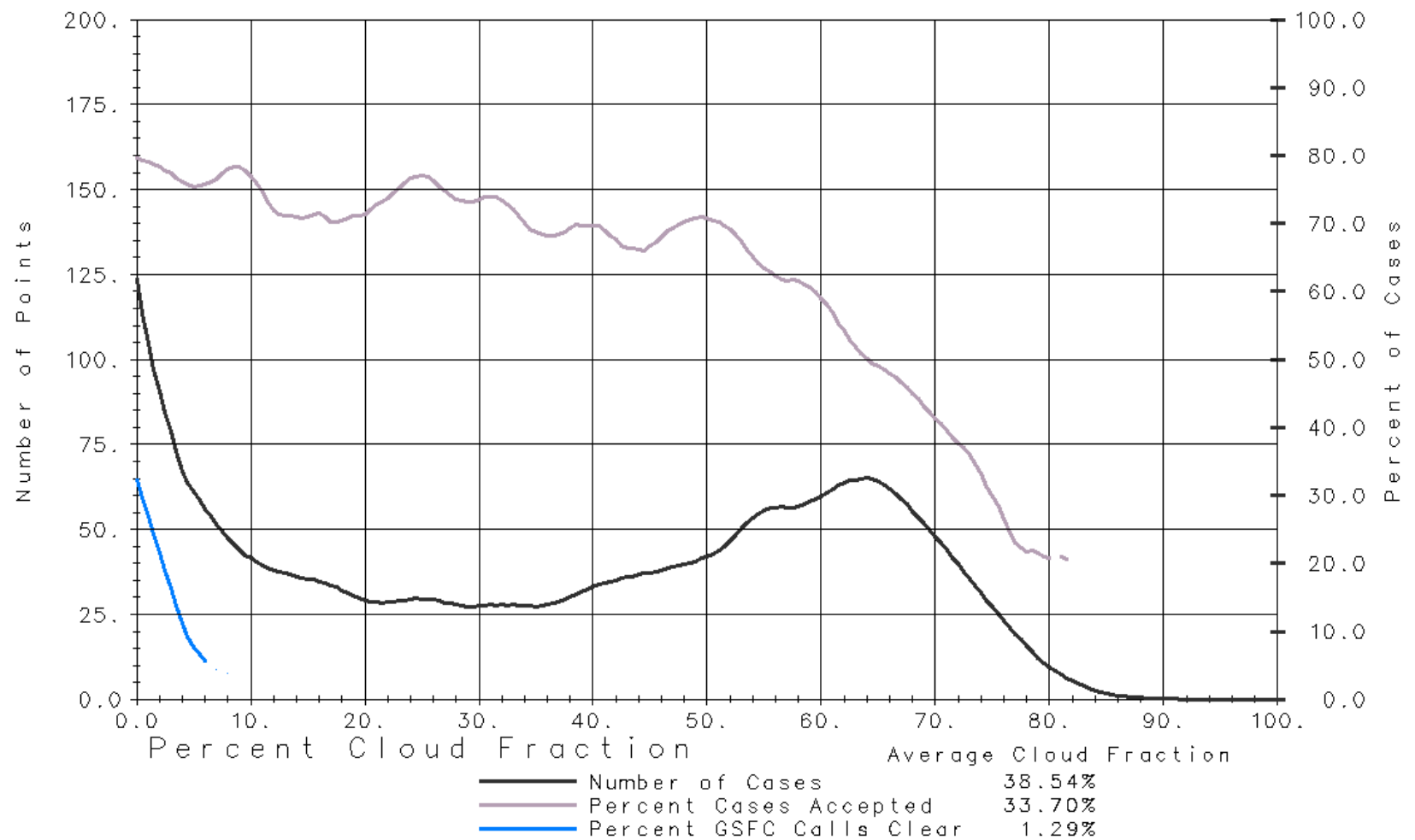
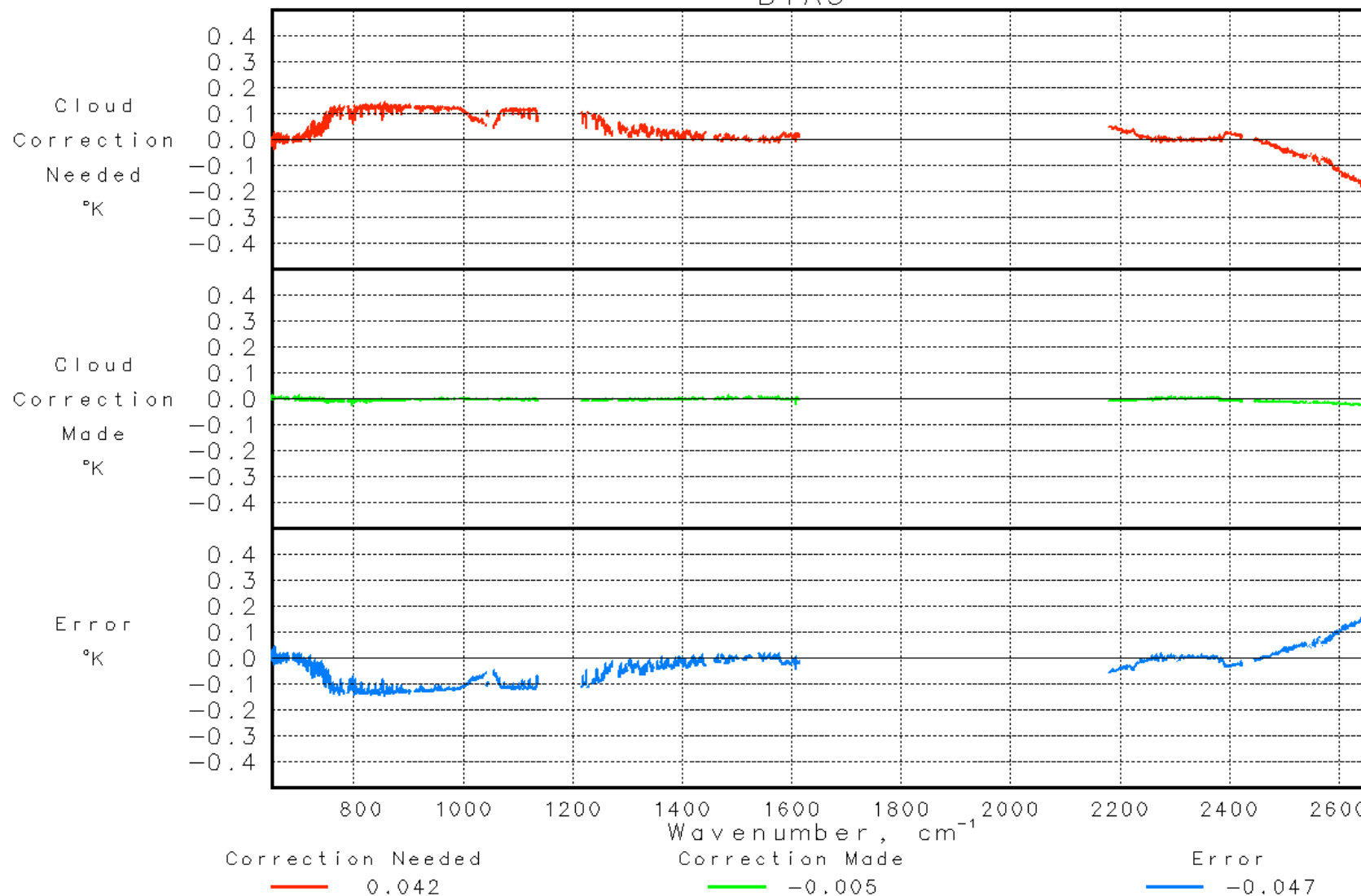   Channel noise covariance matrix

    Rejection criteria

    "BMAX" damping thresholds

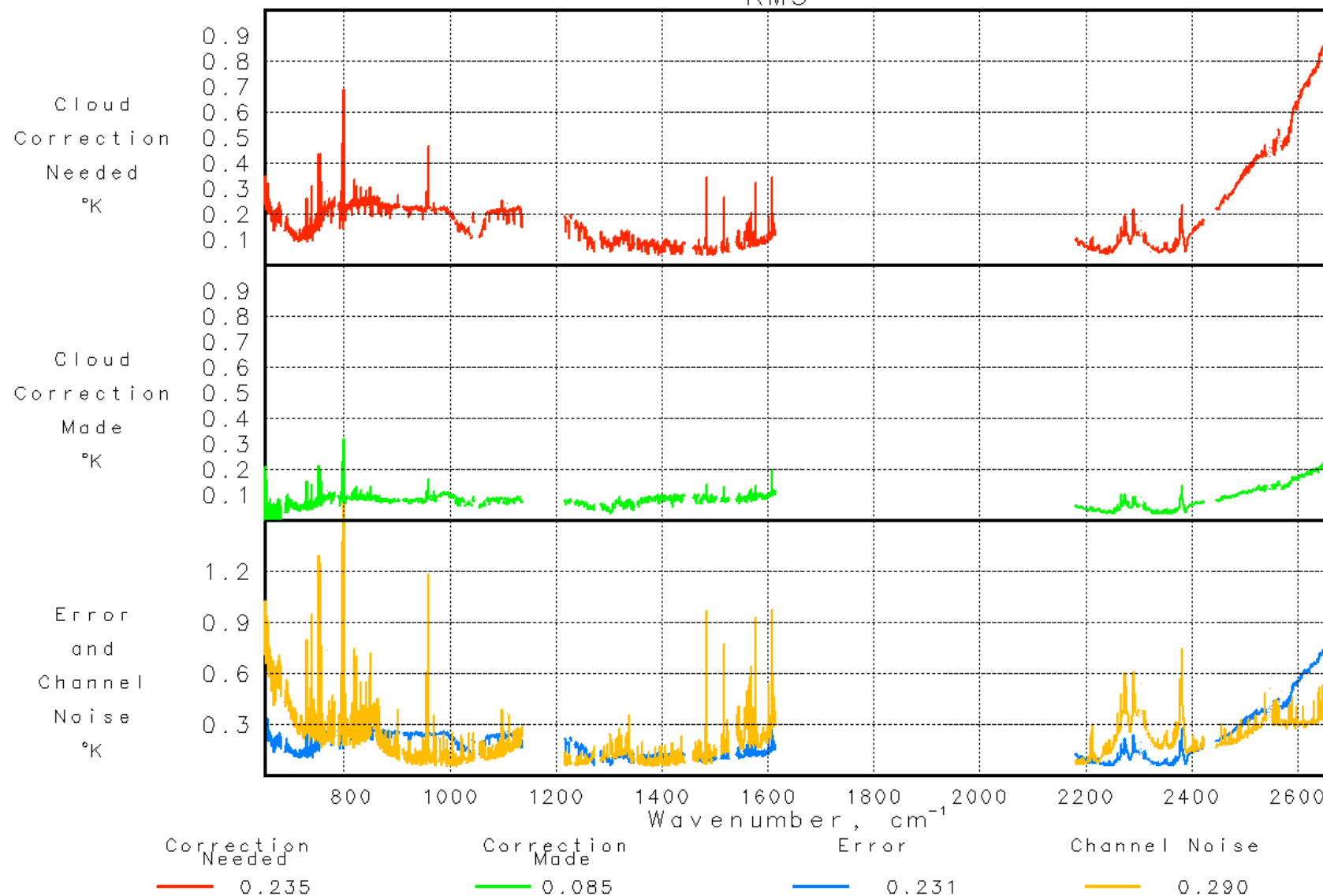Results run at GSFC are very similar to what JPL is getting.

Percent Yield vs. Cloud Fraction

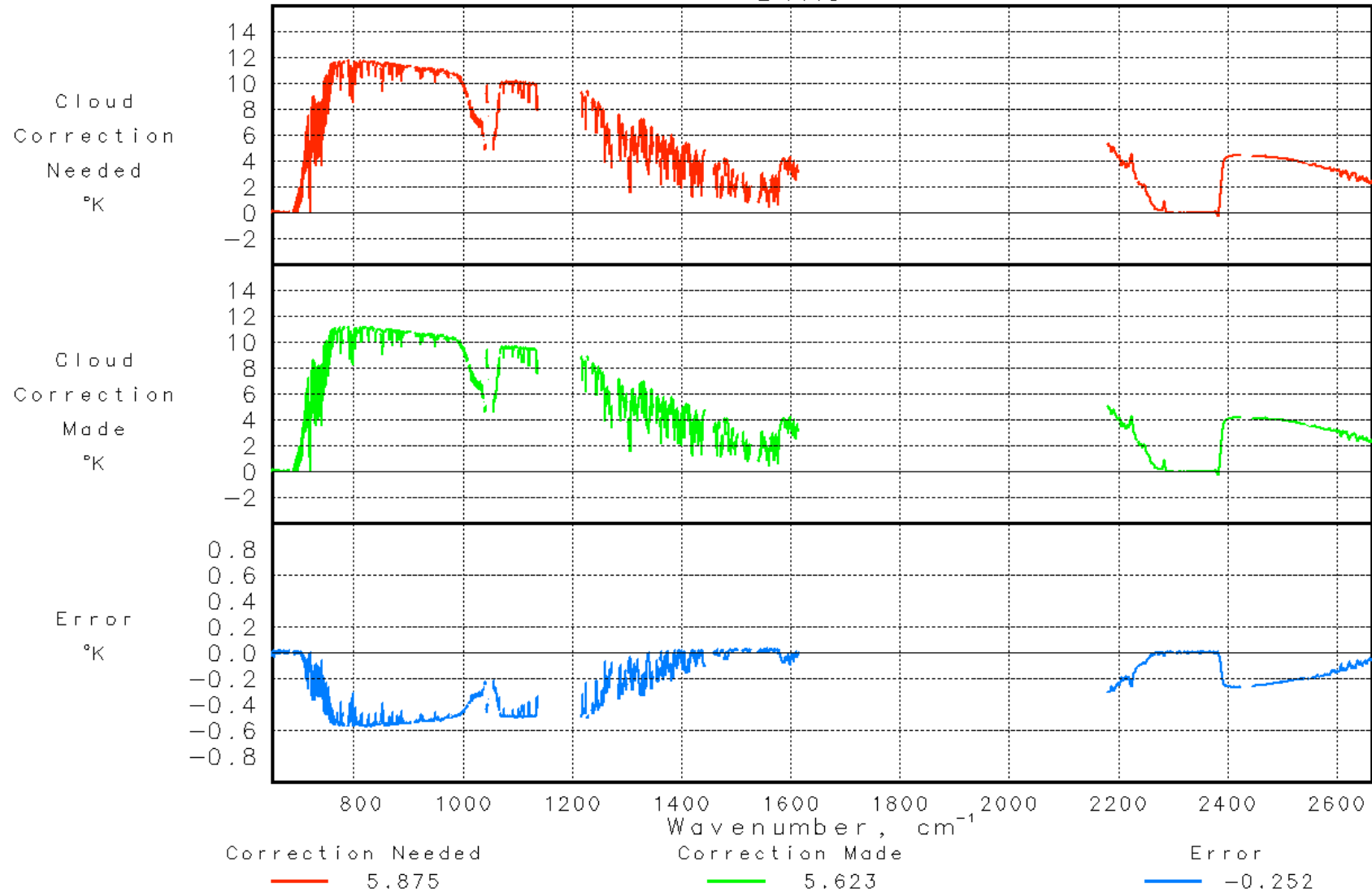Clear Column Brightness Temperature Error
Essentially Clear Cases (426/7200)
BIAS

Cloud Correction Needed °K

Cloud Correction Made °K

Error °K

Wavenumber, cm^{-1}

Correction Needed	Correction Made	Error
0.042	−0.005	−0.047

Clear Column Brightness Temperature Error
Essentially Clear Cases (426/7200)
RMS

	Correction Needed	Correction Made	Error	Channel Noise
	0.235	0.085	0.231	0.290

Clear Column Brightness Temperature Error
All Accepted Cases (4661/7200)
BIAS

Cloud Correction Needed °K

Cloud Correction Made °K

Error °K

Wavenumber, cm⁻¹

Correction Needed	Correction Made	Error
5.875	5.623	−0.252

Clear Column Brightness Temperature Error
All Accepted Cases (4661/7200)
RMS

Cloud Correction Needed °K

Cloud Correction Made °K

Error and Channel Noise °K

Wavenumber, cm⁻¹

Correction Needed	Correction Made	Error	Channel Noise
10.297	9.955	0.699	0.290
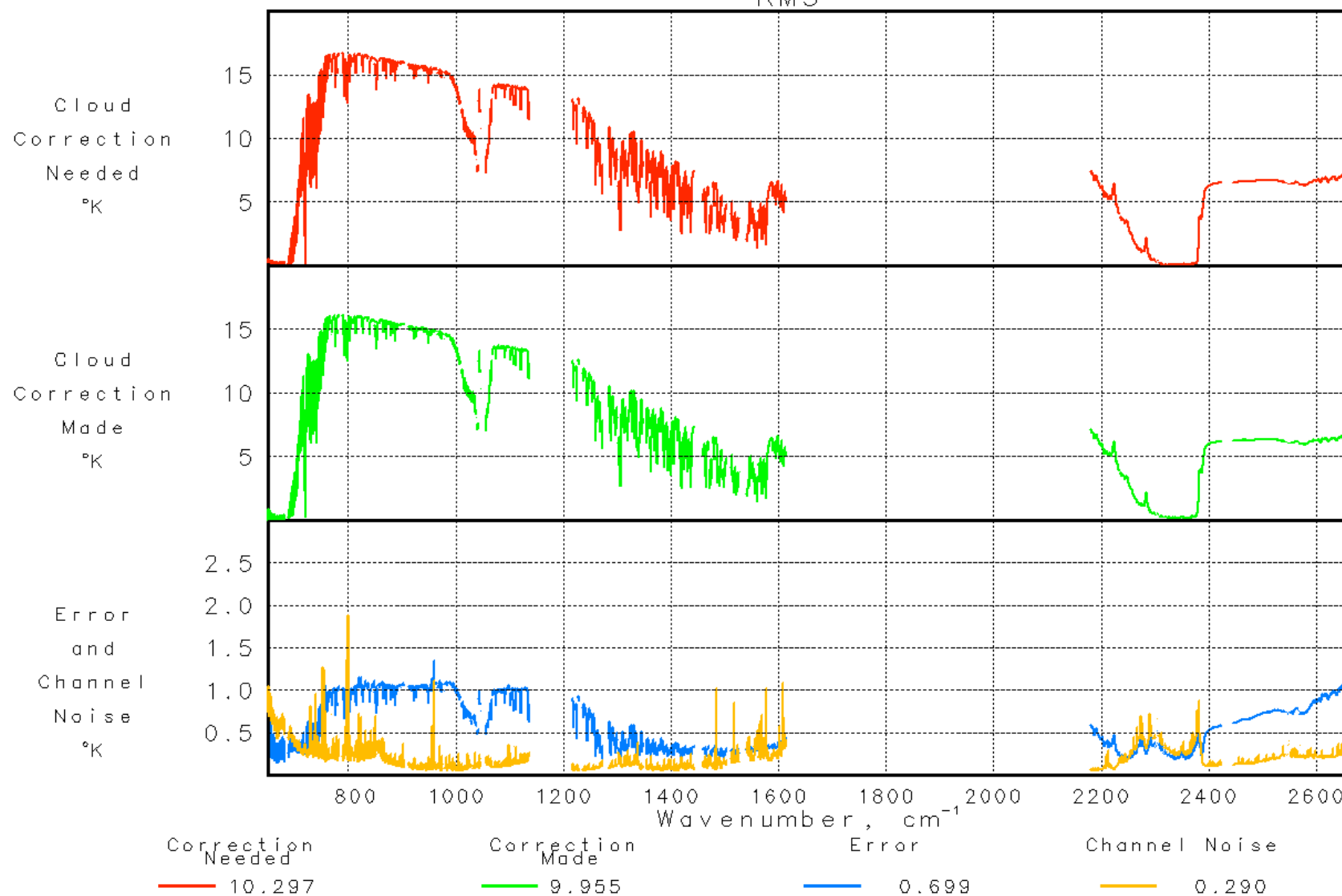
LAYER MEAN RMS TEMPERATURE ERRORS (°C)
All Accepted Cases (64.7%)
Essentially Clear Cases (5.9%)

TEMPERATURE RMS ERRORS   RMS ERROR
SKIN   STATISTICS
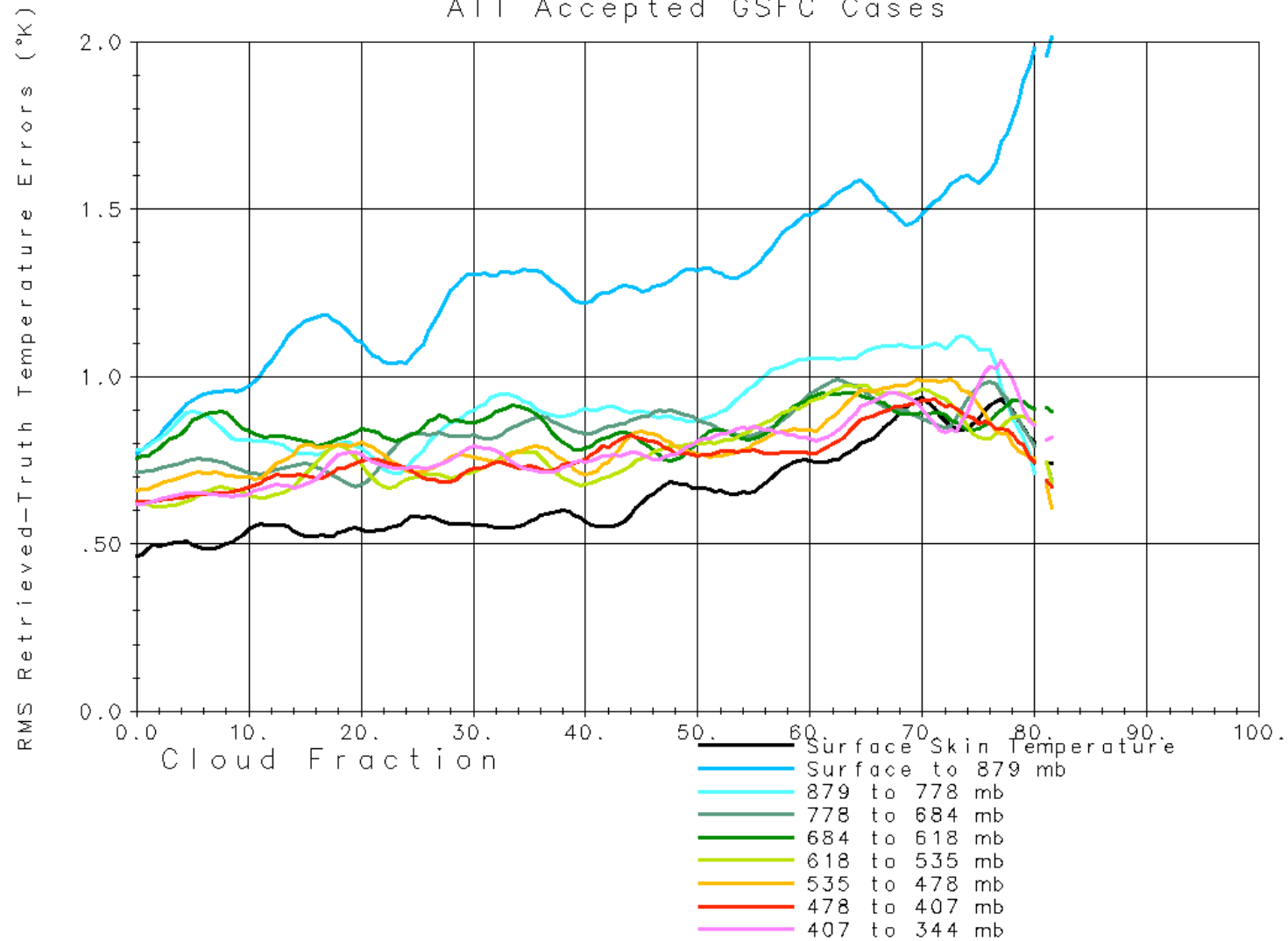TEMP   trop 700-surf
1.57   0.99   1.39   — — All Cases   Regression
0.62   0.83   0.97   —— All Cases   Retrieval
0.50   0.77   0.86   — — Clear Cases   Regression
0.24   0.68   0.68   —— Clear Cases   Retrieval
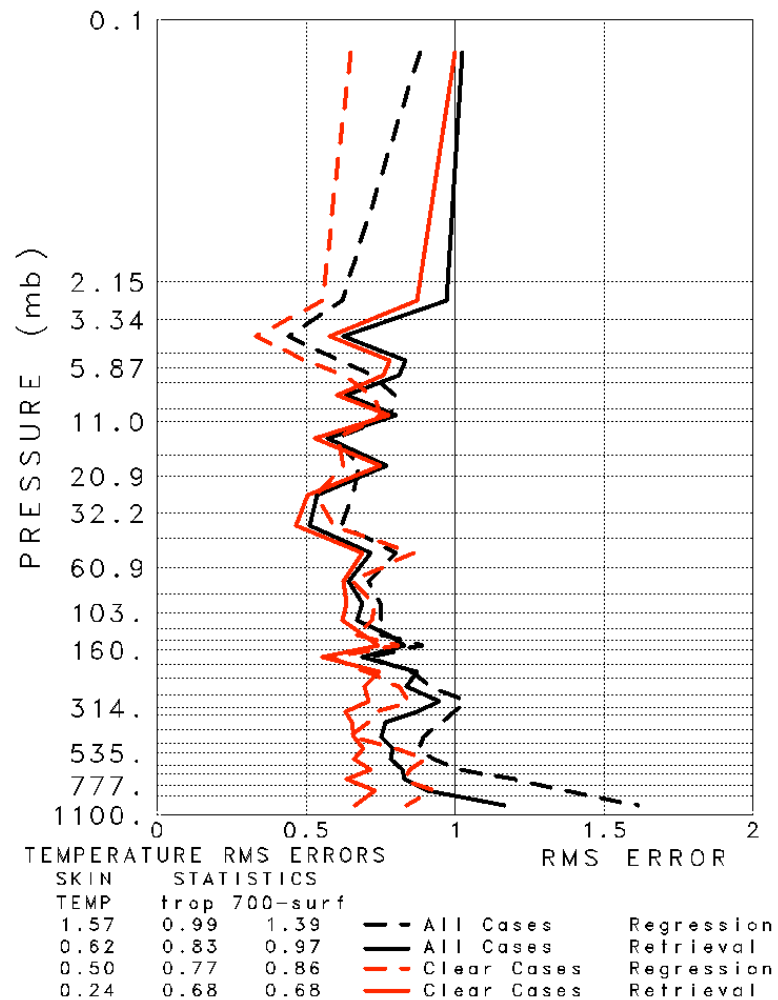
AIRS Mean Temperature Errors vs. Cloud Fraction
December 15, 2000 Data
All Accepted GSFC Cases
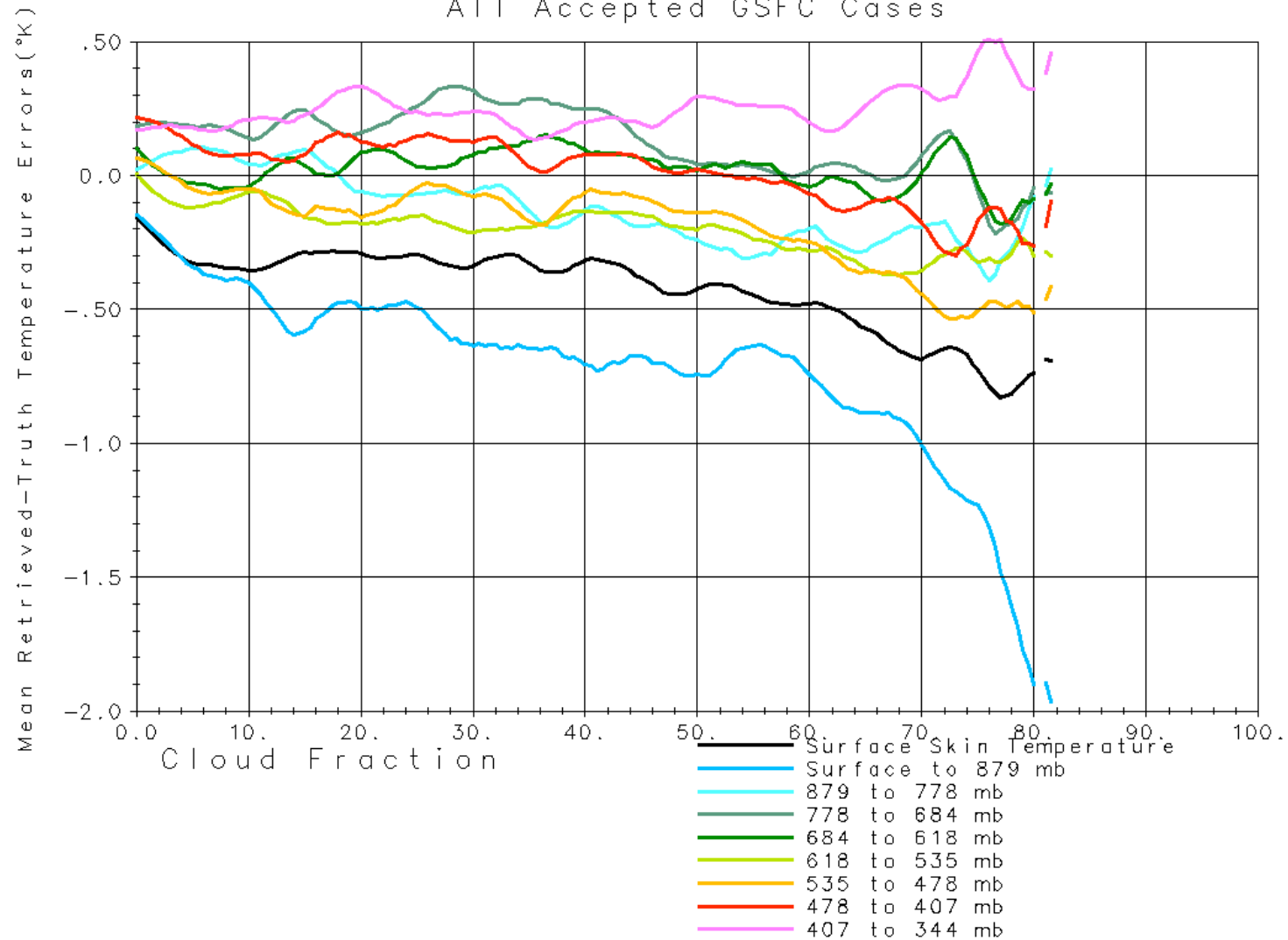
Mean Retrieved-Truth Temperature Errors(°K)

Cloud Fraction

Surface Skin Temperature
Surface to 879 mb
879 to 778 mb
778 to 684 mb
684 to 618 mb
618 to 535 mb
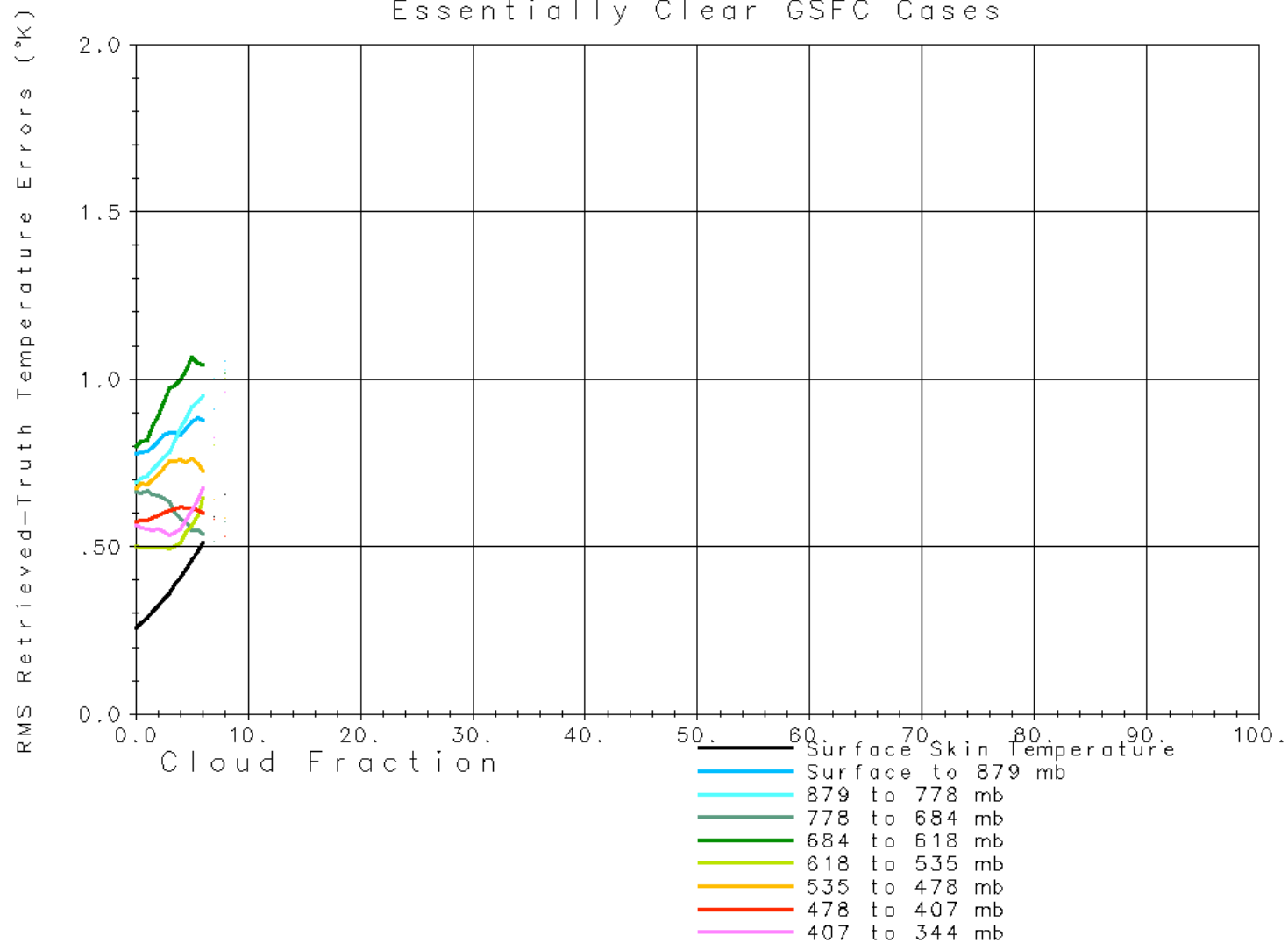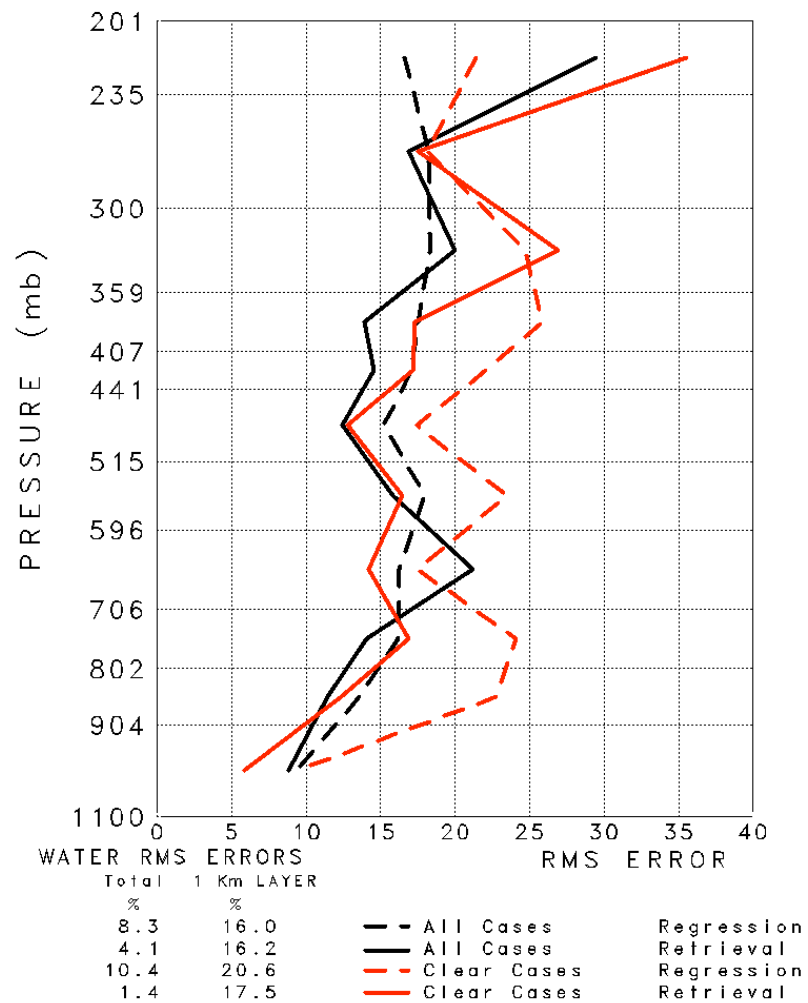535 to 478 mb
478 to 407 mb
407 to 344 mb

AIRS RMS Temperature Errors vs. Cloud Fraction
December 15, 2000 Data
All Accepted GSFC Cases

RMS Retrieved—Truth Temperature Errors (°K)

Cloud Fraction

Surface Skin Temperature
Surface to 879 mb
879 to 778 mb
778 to 684 mb
684 to 618 mb
618 to 535 mb
535 to 478 mb
478 to 407 mb
407 to 344 mb

AIRS RMS Temperature Errors vs. Cloud Fraction
December 15, 2000 Data
Essentially Clear GSFC Cases

Surface Skin Temperature
Surface to 879 mb
879 to 778 mb
778 to 684 mb
684 to 618 mb
618 to 535 mb
535 to 478 mb
478 to 407 mb
407 to 344 mb

1 Km LAYER PRECIPITABLE WATER PERCENT ERRORS
All Accepted Cases (64.7%)
Essentially Clear Cases (5.9%)

WATER RMS ERRORS

Total	1 Km LAYER		
%	%		
8.3	16.0	All Cases	Regression
4.1	16.2	All Cases	Retrieval
10.4	20.6	Clear Cases	Regression
1.4	17.5	Clear Cases	Retrieval

Ozone Profile RMS % Errors
All Accepted Cases (64.7%)
Essentially Clear Cases (5.9%)
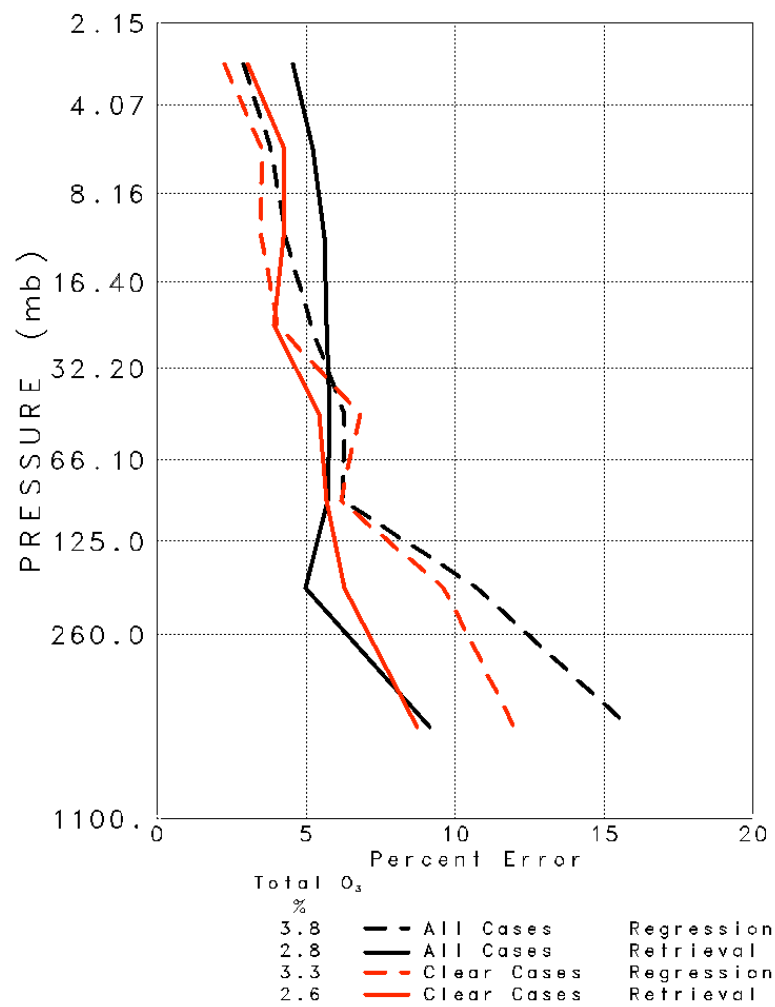
Things We Hope To Change For Final Paper

Install Larry McMillin's angle correction

Use most up to date microwave retrieval

Use the form of the regression described in Mitch Goldberg's paper

    Different from what JPL and we have been running

Possibly improve results to make cold bias less in clear column radiances, lowest level temp

Possibly get improved yield over snow covered land

Things We Want To Do By Launch + 3 Months

Develop robustness at JPL for missing spots, failed channels.

Install microwave retrieval algorithm at GSFC.

Install new first product regression at GSFC.

Install tuning capability at GSFC.

Develop code at GSFC to get T(P), Q(P) errors using matchup files.

Develop (implement) code to compute expected radiances from radiosonde reports.

   Larrabee's code cannot be run here because we don't have Fortran 77 (yet).

Other Things We Want To Do

Calculate cloud parameters at JPL when microwave product fails.

Develop "microwave + AIRS channels unaffected by clouds" algorithm.

   Indicate down to which level highly accurate results exist.